

Remarks

This amendment is in response to the Office Action dated April 24, 2003, the response being due by Aug. 25 (Aug. 24 was a Sunday) by the enclosed petition for extension of time. Claims 1, 3-4, 6, 23-26, 28-29 and 33 have been currently amended, and new claims 38-39 have been added. Claims 9-22 were previously canceled without prejudice. Claims 1-8 and 23-39 are currently pending. Reexamination and reconsideration are respectfully requested.

Claims 1-3 and 7-8 were rejected under 35 U.S.C. 102(b) as unpatentable over U.S. Patent No. 5,994,763 to Ohmuro (hereinafter "Ohmuro"). The rejection is respectfully traversed.

Applicant respectfully submits that the Examiner cited no portion of the art that describes or suggests a method including "forming an electrode having a plurality of layers on a first surface of a semiconductor chip, and then digging a hole from a second surface of the semiconductor chip until the electrode is exposed" as recited in claim 1, as amended.

In addition, applicant respectfully submits that the Examiner has cited no portion of the art that describes or suggests a method "wherein the electrode is formed to include a first layer and a second layer, and the hole contacts the first layer of the electrode, and the first layer of the electrode is positioned between the second layer and the hole" as recited in claim 3, as amended.

Applicant submits that Fig. 2B, as cited by the Examiner at page 2 of the Office Action, does not appear to describe a method in which "the first layer of the electrode is positioned between the second layer and the hole" as recited in claim 3, as amended. Applicant also notes that Ohmuro describes "ER" as "a circuit electrode . . . formed inside the circuit formation area" and "BP" as a "bonding pad BP for wire bonding which is formed in the peripheral area of the circuit formation area." (Ohmuro at col. 1, lines 17-21) Applicant does not understand the Examiner's statement for claim 3 that "the electrode is formed to include a first layer BP and a second layer ER . . ."

Thus, for at least the reasons above applicant respectfully submits that the rejection of claims 1-3 and 7-8 should be withdrawn.

In addition, applicant respectfully submits that the Examiner's citations to the art do not describe or suggest a method "wherein, after the hole is formed, a metal film is formed on the

first layer of the electrode so that the first layer of the electrode is positioned between the metal film and the second layer of the electrode" as recited in claim 8. The Examiner stated in the Office Action at page 2 that "in regard to claims 7-8, a metal 15 is formed on the electrode through the hole see fig. 2B." Applicant respectfully submits that fig. 2B does not describe a method including "the first layer of the electrode being positioned between the metal film and the second layer of the electrode" as recited in claim 8. Accordingly, for the reason above (in addition to the same reason as claim 3, from which claim 8 depends) applicant respectfully submits that the rejection of claim 8 should be withdrawn.

Claims 4-6, 24-26 and 32 were rejected under 35 U.S.C. 103(a) as unpatentable over Ohmuro in view of U.S. Patent No. 6,114,221 to Tonti et al. (hereinafter "Tonti"). The rejection is respectfully traversed.

According to the MPEP section 706.02(j), to establish a prima facie case of obviousness, the following criteria should be met. First, there should be a suggestion or motivation in the art to modify the reference or to combine reference teachings. Second, there should be a reasonable expectation of success. Third, the reference(s) must teach all the claim limitations. MPEP section 706.02(j). Applicant respectfully submits that the Examiner's citations are insufficient to satisfy the criteria above and accordingly, the rejection should be withdrawn.

Applicant respectfully submits that the Examiner's citations to the art do not describe or suggest the combination of elements including, for example, the presence of first and second semiconductor chips and "forming a dielectric layer on the second surface, wherein the dielectric layer has an opening and the electrode is exposed through the opening" and "positioning the second electrode within the hole and in electrical contact with the first electrode" as recited in claim 4. Thus, all the claim limitations of claim 4 are not met by the Examiner's citations to the art. Accordingly, for at least the above reason alone, applicant respectfully requests that the Examiner has not establish a prima facie case of obviousness and the rejection of claim 4 and its dependent claims 5-6 should be withdrawn.

In addition, applicant respectfully submits that the Examiner did not meet his burden to establish a suggestion in the art for the proposed combination of references. The Examiner stated at page 3 of the Office Action that "Ohmuro, in fig. 2B, discloses a chip 1 and thereafter forming

a hole 7.9, from another surface. This structure, however, provides an advantage of saving space when the chips are stacked together. . . . Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Tonti as taught by Ohmuro in order to obtain the advantage as mentioned above." The suggestion to make the claimed invention should be found in the prior art, not the applicant's disclosure. MPEP at section 2143. Applicant respectfully submits that the "advantage above" noted by the Examiner was not described in the cited art. Namely, the Examiner's statement that the structure of Ohmuro ". . . provides an advantage of saving space when the chips are stacked together. . ." was not obtained from Ohmuro. The Examiner cited no portion of Ohmuro suggesting that the hole formed in Ohmuro would be sized appropriately or used for stacking together chips as suggested by the Examiner. Applicant respectfully submits that the Examiner is using improper hindsight. Absent a suggestion in the art for the combination, the Examiner's rationale for the combination is not sufficient. Accordingly, for this reason in addition to the reason noted above, the rejection of claims 4-6 should be withdrawn.

The rejection of independent claim 24 and its dependent claims 25-26 and 32 should be withdrawn for at least similar reasons as claim 4 as described above.

Claims 23 and 27-32 were rejected under 35 U.S.C. 103(a) as unpatentable over Ohmuro in view of Tonti and U.S. Patent No. 5,805,427 to Hoffman ("Hoffman"). The rejection is respectfully traversed.

Applicant respectfully submits that the Examiner's citations to the art do not describe or suggest the combination of element recited in claim 23, as amended, including, for example, the a method including "forming a hole from a second surface of the first substrate to the first surface, wherein a portion of the first electrode is exposed through the hole . . . forming a dielectric layer having an opening therein on the first substrate and positioning the dielectric layer so that a portion of the first electrode is exposed through the opening; and positioning the second electrode in the opening and electrically connecting the first electrode to the second electrode through the opening" as recited in claim 23, as amended. Applicant further notes that the Examiner cited Hoffman and the attachment of central portion 16 with semiconductor device 28 using a die attach 30. (Hoffman at col. 3, lines 20-28) Hoffman Fig. 1 appears to describe the

use of wire interconnects for connections to the semiconductor device 28, which would appear to teach away from its use with embodiments of the present invention.

Applicant respectfully submits that the Examiner has cited no portion of the art that describes or suggests all of the elements of the methods recited in claim 23 and that the Examiner did not meet his burden to establish a suggestion in the art for the proposed combination of references. For either reason alone, the rejection of claim 23 should be withdrawn.

Claims 27-32 depend from claim 24. Claim 24 has been described above and the Examiner's citations to Hoffman do not overcome the deficiencies of Ohmuro and Tonti as described above. In addition, the Examiner's citation of Ohmuro, Tonti and Hoffman does not provide a description or suggestion of all of the method steps recited in these claims. Moreover, as noted above for claim 23, the Examiner did not meet his burden to establish a suggestion in the art for the proposed combination of references. Thus, the rejection of claims 27-32 should be withdrawn.

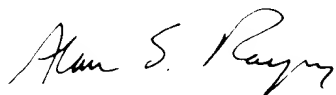
Applicant thanks the Examiner for indicating that claims 34-37 were allowed and that claim 33 would be allowable if rewritten in independent form. Applicant has rewritten claim 33 in independent form.

New dependent claims 38-39 were added. Support for the claims may be found, for example, in the specification at pages 10-11. It is believed that no new matter has been entered. Examination of these claims is respectfully requested.

The Office Action also included various comments concerning the art and the non-patentability of features in various of the pending claims. Applicants respectfully disagree with the Examiner's use of the art and non-patentability conclusions. The discussion above has directly addressed some of those comments and the Examiner's other comments are deemed moot at this time in view of this response. For at least the reasons stated above, applicant respectfully submits that the pending are in patentable form. Reexamination and reconsideration are respectfully requested. If, for any reason, the application is not in condition for allowance, the

Examiner is requested to telephone the undersigned to discuss the steps necessary to place the application into condition for allowance.

Respectfully submitted,



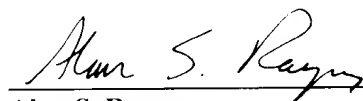
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Alan S. Raynes

August 25, 2003
(Date)